



POSSIBILITY OF COVID-19 RE-INFECTION & LOSS OF ANTIBODIES

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ABSTRACT

Coronavirus is attracting the attention of healthcare professionals and scientists searching for its treatment and vaccine. The study of antibodies is crucial in the development of medicine and the immunization of coronavirus. Antibodies are molecules that are produced by the body or immune system to fight infection. The purpose of this research paper was to determine antibody loss and Covid-19 reinfection.

Antibodies are crucial even if they are produced in small quantities because they can still neutralize the virus. Various researchers show that patients are losing their IgG antibodies. Studies found that about 10% of almost 1,500 patients recovered from Covid-19 produced antibodies out of which 74 lost their antibodies two to three months after recovery.

Studies have revealed that the antibodies level is high during the first three weeks of infection and then declines. Patients with severe illness have more antibody levels than those with mild or asymptomatic patients. It is possible for patients who have recovered from Covid-19 to get infected again; however, researchers should conduct more studies to prove this argument.

The methodology used in this study was the literature search. The researcher obtained data from various literature work and data obtained analyzed qualitatively by identifying and deriving meaning from the literature work. The findings suggest that patients who have recovered from coronavirus are losing their antibodies. The study also found that Covid-19 recovered patients can be affected again, but more research is needed.

The discussion section of the paper discussed the findings by relating them with what other researchers have found. One limitation of the study was the few scientific journals and peer-reviewed articles to support the conclusions. The future scope is the need for further research.

INTRODUCTION:

The emergence of a novel coronavirus in December 2019 in Wuhan China has attracted the researchers worldwide searching for the vaccine [1]. The patient who recovers from an infection such as the Covid-19 can develop antibodies that protect them from reinfection. Antibodies are molecules produced by the body or immune system to fight infection [2].

Scientists must understand how the patient develops antibodies because to guide them to create vaccine and treatment for Covid-19. For instance, some scientists are trying to determine if they can separate antibodies from people who have recovered and use them to treat infected patients [3].

Despite the efforts put forth by scientists to study antibodies and see if they can use it to develop vaccine or treatment for Covid-19, some reports suggest a loss of antibodies and recovered patients may be re-infected. The purpose of this research paper was to explore the loss of antibodies and Covid-19 reinfection.

The researcher achieved this objective by analyzing various literature work and scientific reports. This paper's primary focus is to determine whether there is antibody loss for the recovered persons and determine whether the recovered Covid-19 patients can get the disease again.

It was critical to understand this research topic because it informs the researchers on whether they should continue relying on antibodies to develop vaccine and treatment for Covid-19, or they should try something else.

REVIEW OF LITERATURE:

Loss of antibodies:

Antibodies are molecules produced by the immune system to prevent a person from infection [4]. Following the outbreak of Covid-19, healthcare professionals and researchers have focused on studying antibodies from the recovered patients. Antibodies are crucial even if produced in small quantities because they can still neutralize the virus [5]. According to the study [6], various researchers show that patients are losing their IgG antibodies. Although multiple studies show that patients lose their antibodies, they have not demonstrated whether they can be infected again after losing their antibodies.

One study found that about 10% of almost 1,500 patients recovered from Covid-19 produced antibodies [7]. However, the antibodies were undetectable, out of which 74 lost their antibodies two to three months after recovery. This finding shows unusual behavior of Covid-19 because antibodies produced by coronavirus families such as SARS and MERS stay in the body for about a year [8]. Studies have also shown that antibodies decline over time [7].

In a study conducted by Dr Doores that examined antibody levels of 90 patients of Covid-19 and healthcare workers, the findings revealed that the antibodies level is high during the first three weeks of infection and then decline [9]. The studies also showed that patients with severe illness had more antibody levels than those with mild or asymptomatic patients. However, this researcher suggested the need for further studies to determine the antibody's longevity on the infected persons. According to [10], more studies have focused on neutralizing antibodies against SARS-CoV-2 and, results show that such antibodies remain high only in a few weeks and then begin to wane [8].

Covid-19 Reinfection:

Experts have argued that it is not easy to tell whether people can be re-infected from Covid-19 once they have recovered [9]. There is a need for further studies to determine whether the recovered patients can be affected again because it is only months since coronavirus emerges. Shreds of evidence have been anecdotal [10]. Despite few studies, it can be a drawback in the effort of finding vaccine and medication for Covid-19 is the studies confirm cases of reinfection because patients usually develop antibodies to fight infection once they have been affected. Reinfection could damage the patients' immune system, making them more susceptible to other diseases [11].

RESEARCH METHODS:

The methodology used in this research was the literature search. A literature review is a research method because it involves identifying, recording, making meaning, and transmitting information [12]. The researcher used a literature review as a data collection tool. Using this tool, the researcher collected information related to the issue of interest from various researched work. Using a literature review as the data collection method involved identifying, understanding, and making meaning from the articles used.

Since the issue addressed is still new and few peer-reviewed articles concerning coronavirus, the literature search included articles and reports from medical sites and reliable news sites. Boolean operators were used during the quest to obtain relevant materials that were used in the study. Key terms that were used in the search database include; coronavirus, antibodies, and reinfection. Furthermore, the inclusion and exclusion criteria were also used to obtain a manageable number of studies with high quality and relevant data.

Data analysis was done qualitatively by considering the nature of the literature work used. Most articles used were qualitative; hence, it was easy to analyze data qualitatively by summarizing significant findings of the materials and generating meaning and conclusion using the ground theory analysis model. This analysis technique involved creating themes and implications from the given set of data. Findings and analysis

After analyzing various literature addressing the topic being investigated and generating meaning from them, multiple findings were obtained. One result was that patients who have recovered from coronavirus are losing their antibodies. Antibodies are high at the beginning of the infection and among the most severe patient but decline over time. From the results, neutralizing antibodies remain high only in a few weeks and then begin to wane. Studies indicate that Covid-19 patients can be infected again. Further, the findings showed that reinfection could damage the patients' immune system, making them more susceptible to other diseases that may also worsen the condition.

DISCUSSION:

Findings from various articles used in the study supported the issue being investigated that patients are losing their antibodies, and there is the possibility of reinfection. Patients who have recovered from infection usually develop antibodies to protect them from similar viruses [2].

Although recovered patients develop antibodies, the rate in which they lose their antibodies is of significant concern. Antibodies may not last forever; however, it takes a shorter time for Covid-19 patient, considering that the infection is still high, thus putting the recovered patient at risk of being affected again.

Concerning the issue of reinfection, only one article or report suggests that one patient in Massachusetts Hospital was re-infected; however, the time taken for that patient to be affected again was short (only 10-days) [11]. There might be other scientific explanations of why the patient exhibits the symptoms still, considering that the patient was 82-years old who may have a weak immune system. Although the results support the topic being investigated, most articles or reports recommended further studies to support or refute their findings, meaning that the above results may not reveal the situation's reality.

LIMITATIONS:

This research study relied on a literature search with the unreviewed result; hence, the results may not be reliable. The issue under investigation involved coronavirus, a disease that is still at the initial stage. There are few research works related to the research topic making it difficult to obtain reliable materials. It was not easy to get reputable scientific journals to support the findings.

FUTURE SCOPE:

There is a need for further research concerning the loss of antibodies and the reinfection of coronavirus because most articles used in this study suggested the same.

Future studies should also focus on whether the study of antibodies should be used to generate vaccine or treatment, considering that some antibodies take a shorter time. Additionally, future studies must answer why the recovered patients lose their antibodies more than other infections related to coronaviruses such as SESRS and MERS.

REFERENCES:

- I. Zhu, N., Zhang, D., Wang, W., and Li, X. A novel coronavirus from patients with pneumonia in China The New England Journal of Medicine (2020) DOI:10.1056/NEJMoa2001017
- II. National Health Institute Potent antibodies found in people recovered from COVID-19 National Institute of Health Research Matters (30 June 2020) DOI: 10.1016/j.cellimm.2020.104114
- III. Vabret, N., Britton, G.J., Gruber, C., Hedge, S., et al. Immunology of COVID-19: Current State of the Science Elsevier Public Health Emergency Collection (vol. 52, no. 6, pp. 910-941, 16 June 2020) DOI:10.1016/j.immuni.2020.05.002
- IV. World Health Organization Immunity passports" in the context of COVID-19 Scientific Brief, (24 April 2020) https://www.who.int/news-room/commentaries/detail/immunity-passports-in-the-context-of-covid-19?gclid=CjwKCAjwgdX4BRB_EiwAg8O8Hbkd2BAdFyxJPVWAL5EilCMiEJxCmt_YXSBquc-hgG-_0fB1_G6HBoCMEAQA_vD_BwE
- V. Robbiani, D.F., Gaebler, C., & Nussenzweig, M.C. Convergent antibody responses to SARS-CoV-2 in convalescent individuals Nature, (18 June 2020) <https://doi.org/10.1038/s41586-020-2456-9>
- VI. Qin C., Zhou L., Hu Z., Zhang S., Yang S., Tao Y., Xie C., Ma K., Shang K., Wang W., Tian D.-S. Dysregulation of immune response in patients with COVID-19 in Wuhan, China Clin. Infect. Dis. (2020) DOI: 10.1093/cid/ciaa248
- VII. Malgaco, J.G., Azamor, T., & Bom, A.P.D. A Protective immunity after COVID 19 has been questioned: What can we do without SARS-CoV-2-IgG detection? Cell Immunology, (2020) DOI: 10.1016/j.cellimm.2020.104114
- VIII. Wu F., Wang A., Liu M., Wang Q., Chen J., Xia S., Ling Y., Zhang Y., Xun J., Lu L., Jiang S., Lu H., Wen Y., & Huang, J. Neutralizing antibody responses to SARS-CoV-2 in a COVID-19 recovered patient cohort and their implications Infectious Diseases, (2020) DOI:10.1101/2020.03.30.20047365
- IX. Callaway, E., Ledford, H., & Mallapaty, S. Six months of coronavirus: the mysteries scientists are still racing to solve Nature Research Journal, (03 July 2020) <https://www.nature.com/articles/d41586-020-01989-z>
- X. Centers for Disease Control and Prevention Coronavirus disease 2019: Test for past infection (30 June 2020) <https://www.cdc.gov/coronavirus/2019-ncov/testing/serology-overview.html>
- XI. Zhang W, Du R, Li B, & Zheng X Molecular and serological investigation of 2019-nCoV infected patients: implication of multiple shedding routes Emerging

Microbes Infection, vol. 9, no. 1, (2020) pp. 386-389
DOI:10.1080/22221751.2020.1729071

- XII. H. Snyder Literature review as a research methodology: an overview and guidelines Journal of Business Research, 104 (2019) PP. 333-339
10.1016/j.jbusres.2019.07.039